Clean notes on do-MPC Paper

2025/01/05

Substrate Data

Nominal Values (update of Julius' values)

literature values

- pH
  - Mais/Gras/Zuckerrübensilage (Weißbach Papers (2008)); Mais: 3.8; Gras: 4.8; Rübe: 3.9
  - Rindergülle (Fisgativa (2020)): 8,54
- BMP (only absolute values, no VCs or SDs):
  - Mais/Gras/Rindergülle: aus Datenmatrix_Batchtversuche_DBFZ 03.11..xlsx, siehe [hier] (S:\Laborорganisation\Eudiometer\DBFZ Datensammlung Batchversuche) (DBFZ)
  - Zuckerrübe: Vazifehkhoran (2016): 389 NL/kg VS (open silos, weil realistisch und näher an KTBL-Wert von 349)
- other values:
  - average of full substrate samples (acc. to bk_numbers hier)
  - computation acc. to here with method 2 for carbs
  resulting nominal values (means):

Substrate	TS [%]	BMP [NL CH4/kg VS]	XA [%TS]	XP [%TS]	XL [%TS]
Maize silage	33.73	357	4,43	7.81	2.44
grass silage	31.74	372	11.29	13.93	2.14
sugar beet silage	39.28	389	9.39	3.39	0.19
cattle manure	8.08	246	23.65	16.63	2.39

Uncertainties (update of Julius' values)

Variations coefficients

Variable	VC [%]	relevant change vs. MA Julius, Tab. 3.1	reference
TS	1,94		Félix Paper (Stand 17.12.24)
BMP	8,23		Hafner (2018) (mean of all 4 substrates)

Variable	VC [%]	relevant change vs. MA Julius, Tab. 3.1	reference
XA	7,4	ja, stark gesunken	Félix Paper (Stand 17.12.24)
XP	5,52		Félix Paper (Stand 17.12.24)
XL	10,04		Félix Paper (Stand 17.12.24)

Disturbance feeding

Scenario 1:

- allow max. OLR of 1/2/3 kg VS/m³/d, calculated with nominal values of cattle manure
- with VS of cattle manure of 42,04kg VS/m³, this results in disturbance volume flows of 11,63/7,76/3,88 m³/d
  Scenario 2:
- Julius' volume flow of 4,5m³/d is okay, this results (with nominal substrate characterization of cattle manure, 42,04kg VS/m³) in an OLR of 1,16 kg VS/m³/d

New DBFZ substrate data (2025)

resulting nominal values (means):

Substrate	TS [%]	KTBL TS [%]	XA [%TS]	XP [%TS]	XL [%TS]	relevante Veränderung ggü. MA Julius, Tab. 3.1
Maize silage	31	35,1	3,75	7,09	4,57	XL
grass silage	26	28,2	11,46	13,22	3,39	TS, XL
sugar beet silage	24	22,5	7,81	7,32	1,54	XP, XL, TS
cattle manure	8	8,9	23,84	16,39	5,03	XL
chicken dry manure	51	50,9	30,19	25,94	3,10	

- numbers of samples:

Substrate	# total	# pH (XY 2024 data still missing)	# GC
Maize silage	10	1	5
grass silage	16	7	8
sugar beet silage	15	0	9
cattle manure	12	9	9

Substrate	# total	# pH (XY 2024 data still missing)	# GC
chicken dry manure	17	2	14

Note: only "limiting factors" are shown in above table, for other variables there are more samples differences compared with Julius' MA:

- CH: jetzt viel niedriger bei Rübe
- LI: jetzt überall viel höher
- ion: gras/mais jetzt höher; Rübe/Gülle jetzt niedriger